REMARKS

Claims 6-7 are pending and are presented for reconsideration.

Applicant's thank Examiners Sackey and Saeed for the courtesy extended to Applicants representative in the Interview of May 9, 2006. This Response presents the arguments and relevant support discussed in the Personal Interview. Applicants thank the Examiners for indicating that the arguments and support have been deemed sufficient to overcome the rejection of record.

Claims 6 and 7 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the '947 Patent.

As discussed in the Personal Interview, neither the '947 Patent nor WO 98/25918 (the published PCT patent application discussed in the specification) disclose nitroxyalkylesters of 2-(6-methoxy-2-naphthyl)-propanoic acid having an enantiomeric excess of the (S) form higher than or equal to 97%, as claimed in Claim 6, or 98% as claimed in Claim 7. Rather, as disclosed in Applicant's specification, utilizing the process according to WO 98/25918, an enantiomeric excess of only 94% was attained.

Applicants note that the enantiomeric excesss of a mixture of two enantiomers may be determined, for example, by the following simple formula where the amount of each enantiomer produced is known:

$$\text{enantiomeric excess} = ((R-S)/(R + S)) \times 100\%$$

with "R" and "S" in the above formula being the respective fractions of enantiomers in a mixture such that R+S is 1.

As noted above, the (S)-2-(6-methoxy-naphthyl)propanoic 4-nitroxybutyl ester obtained according to the process of WO 98/25918 has an enantiomeric excess of 94%. As such, the resulting mixture has 97% of the (S)-enantiomer and 3% of the (R)-enantiomer (97% - 3% = 94%).

On the other hand, the (S)-2-(6-methoxy-naphthyl)propanoic 4-nitroxybutyl ester obtained according to claim 7, for example, has an enantiomeric excess of at least 98%, and thereby contains at least 99% of the (S)-enantiomer and at most 1% of the (R)-enantiomer (99% - 1% = 98%).

The compounds according to the invention are significantly higher in enantiomeric purity than the compounds of WO 98/25918. The compounds of the reference contain 3% enantiomeric impurities (i.e. 3% of the (R)-enantiomer of the 2-(6-methoxy-2-napthyl)propanoic 4-nitroxybutyl ester), while the compounds of the present claims contain at most 1.5% of the (R)-enantiomer, i.e. at least 50% fewer enantiomeric impurities. This is not only a practical, but a patentable, improvement.

As discussed in the personal interview, the present situation falls squarely within the case *In re Cofer*, 354 F.2d 664 (CCPA 1966), which is discussed in MPEP §2144.04, § VII. A copy of the *Cofer* case is attached to this response.

In the *Cofer* case, a certain compound (termed "2,2-B") was known in the prior art at a purity level of 90.6%. The inventors claimed a "substantially pure" form of 2,2-B, and the claim was rejected as obvious over the prior art. Reversing the Examiner's rejection, the CCPA held that the purified material was patentable over the prior art because the prior art neither inherently disclosed the purified material, nor disclosed

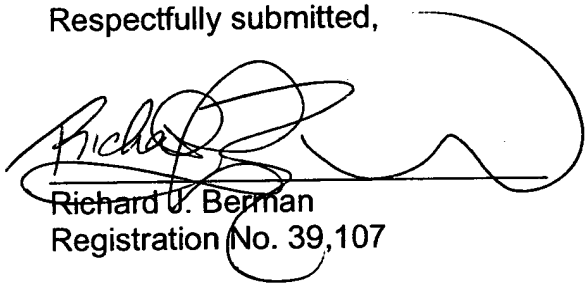
processes to make the purified form. Thus, the prior art could not have been modified by those of ordinary skill in the art by routine experimentation.

As indicated above, the present situation falls squarely within the *Cofer* case. Here, the closest prior art, WO 98/25918, only is capable of producing an enantiomeric excess of 94%, and neither discloses nor suggests any processes to make forms of the compound containing the enantiomeric excess claimed in Claims 6 and 7. Thus, one of ordinary skill in the art could not merely modify the teachings of WO 98/25918 by routine experimentation Therefore, the present invention is patentable in light of the prior art.

In view of the remarks above, Applicants respectfully submit that this application is in condition for allowance and requests favorable action thereon. If the Examiner believes that anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicants undersigned representative at the telephone number listed below to schedule a personal or telephone interview to discuss any remaining issues.

In the event this paper has not been timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension, together with any additional fees that may be due with respect to this paper, may be charged to counsel's Deposit Account No. 01-2300, referencing attorney-docket number **026220-00038**.

Respectfully submitted,



Richard J. Berman
Registration No. 39,107

Customer No. 004372
ARENT FOX PLLC
1050 Connecticut Avenue, N.W., Suite 400
Washington, D.C. 20036-5339
Tel: (202) 857-6000
Fax: (202) 857-6395
RJB/als

Enclosure: Petition for Extension of Time (1 month)

354 F.2d 664

53 C.C.P.A. 830, 354 F.2d 664, 148 U.S.P.Q. 268
(Cite as: 53 C.C.P.A. 830, 354 F.2d 664)

C

United States Court of Customs and Patent Appeals.
Application of Kenneth B. COFER.
Patent Appeal No. 7449.

Jan. 13, 1966.

Proceeding on patent application Serial No. 14,497, as to a free flowing crystalline form of a diepoxide previously known only as a liquid chemical compound. From a decision of the Board of Appeals affirming the examiner's rejection of claims one and eight, the applicant appealed. The United States Court of Customs and Patent Appeals, Worley, Chief Judge, held that the claims were patentable over prior art.

Reversed.

West Headnotes

[1] Patents 291 ⇐113(6)

291 Patents
291IV Applications and Proceedings Thereon
291k113 Appeals from Decisions of Commissioner of Patents
291k113(6) k. Review on Appeal in General. Most Cited Cases
Determination of appeal in patent application is made exclusively on record made in patent office. 35 U.S.C.A. § 144.

[2] Patents 291 ⇐113(6)

291 Patents
291IV Applications and Proceedings Thereon
291k113 Appeals from Decisions of Commissioner of Patents
291k113(6) k. Review on Appeal in General. Most Cited Cases
On appeal from rejection of claims in patent application relating to chemical compound United States Court of Customs and Patent Appeals would not take judicial notice of chemistry textbook relied on as support for patent office position but not made part of evidence produced before patent office where textbook appeared to relate to highly technical and empirical area of chemistry and court had no independent way of evaluating its repute and notoriety in the art. 35 U.S.C.A. § 144.

[3] Patents 291 ⇐66(1.12)

291 Patents
291II Patentability
291II(D) Anticipation
291k63 Prior Patents
291k66 Operation and Effect
291k66(1.12) k. Compositions, Compounds, and Medicinal Preparations. Most Cited Cases
Claims 1 and 8 in patent application relating to free flowing crystalline form of a diepoxide previously known only as a liquid chemical compound were patentable over prior art. 35 U.S.C.A. §§ 103, 144.

Patents 291 ⇐328(2)

291 Patents
291XIII Decisions on the Validity, Construction, and Infringement of Particular Patents
291k328 Patents Enumerated
291k328(2) k. Original. Most Cited Cases
2,506,486, 2,530,353, 2,467,171. Cited.

****664 *831** James H. Parker, Emeryville, Cal., Edward B. Beale, Washington, D.C. (Martin S. Baer, Emeryville, Cal., of counsel), for appellants.
Clarence W. Moore, Washington, D.C. (Joseph Schimmel, Washington, D.C., of counsel), for Commissioner of Patents.

Before WORLEY, Chief Judge, and RICH, MARTIN, SMITH and ALMOND, judges.

53 C.C.P.A. 830, 354 F.2d 664, 148 U.S.P.Q. 268
(Cite as: 53 C.C.P.A. 830, 354 F.2d 664)

WORLEY, Chief Judge.
This appeal is from the decision of the Board of Appeals affirming the examiner's rejection of claims 1 and 8 in appellant's application[FN1] entitled 'High Purity Diepoxide.'

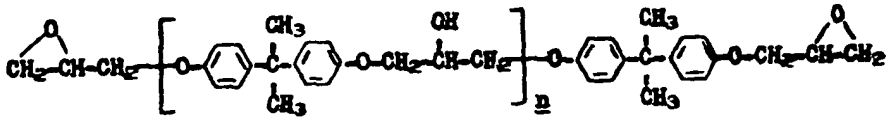
FN1. Serial No. 14,497, filed March 14, 1960.

The subject matter is reflected in claims 1 and 8:

1. As a manufacture, free-flowing crystals of 2,2-bis (2,3-epoxypropoxyphenyl) propane.

8. As a manufacture, free-flowing crystals of substantially pure 2,2-bis (2,3-epoxypropoxyphenyl) propane characterized by a sharp melting point of about 43.5 degrees C, a weight-to-epoxide ratio of about 170 grams per gram equivalent epoxide, total chlorine content of less than 0.1 percent by weight, saponifiable chlorine content of less than 0.01 percent by weight, total hydroxyl content and phenolic hydroxyl content of less than 0.01 gram equivalents per 100 grams, each, and a viscosity, when a supercooled liquid, of less than about 40 poises at 25 degrees C.

The compound of the claims, 2,2-bis (2,3-epoxypropoxyphenyl) propane (also known as the diglycidyl either of 2,2-bis (4-hydroxyphenyl) propane and hereinafter termed 2,2-B) is well known to those skilled in the art as useful in the **665 preparation of thermosetting *832 epoxy resins. The compound is the simplest member (n=0) of a family of diepoxides of the formula



Those compounds are produced by the reaction of epichlorohydrin with 2,2-bis (4-hydroxyphenyl) propane, the latter compound also being known as ' Bisphenol A.' The simplest addition product

formed in that reaction is 2,2-B resulting from a combination of two parts epichlorohydrin and one part 'Bisphenol A.' Higher molecular weight diepoxides which contain epichlorohydrin and ' Bisphenol A' in ratios of 3:2, 4:3 and the like, are also formed in that reaction. By appropriate control of the ratio of epichlorohydrin to 'Bisphenol A' in the reaction, complex liquid mixtures which contain a relatively high proportion of 2,2-B, e.g. 70% To 90% Of the total reaction product, can be produced. According to appellant's specification no method has yet been described which permits production of pure 2,2-B directly by the reaction of epichlorohydrin with 'Bisphenol A.' Prior attempts to recover 2,2-B have resulted only in recovery of a relatively viscous liquid containing impurities which adversely affected the usefulness of epoxy resins prepared therefrom.

Appellant has found that substantially pure 2,2-B is capable of existing in crystalline form and can be recovered from certain concentrates of the compound using controlled crystallization methods. [FN2] The free-flowing crystals are disclosed to be advantageous with respect to handling convenience and, when combined with the usual amine or anhydride curing agents, are said to produce thermoset epoxy resins equal or superior to those produced from the liquid 2,2-B compositions.

> FN2. The examiner stated that 'the Patent Office has recognized his contribution to the art by allowing claims drawn to methods of crystallizing and recovering' crystalline 2,2-B in other patent applications.

The references are:

Werner et al.	2,467,171 April 12, 1949.
Bender et al.	2,506,486 May 2, 1950.
Havens	2,530,353 November 14, 1950.
Dearborn et al. Ind. and Eng. Chem., Volume 45, pages 2715-21 (1953).	

Werner, Bender and Dearborn all name the

compound 2,2-B and characterize it as a liquid. Werner, for example, discloses that both stereoisomers of 2,2-B were recovered in the form of 'water white somewhat viscous liquids.' Bender discloses a 90.6% Concentrate of 2,2-B to be a ' viscous liquid (5000 centipoises at 25 degrees C.).' Dearborn***833** states that epoxy resins having the structure depicted earlier in this opinion are 'liquid or solid depending on the degree of polymerization, indicated by n,' and that 2,2-B is an 'amber liquid.' Havens discloses 2,2-B as a stabilizer for resins.

Up to the time of his Answer, the examiner's rejection of the claims appears to have been founded on two separate grounds. In the final rejection the examiner stated:

Claim 1 is again rejected as unpatentable over Werner et al, * * * Dearborn et al, Havens and Bender et al, all of record and which disclose the diglycidyl ether of Bis-phenol A. Whether or not applicant considers the free flowing ****666** crystals of the claimed compound as a product of manufacture or as a compound per se is immaterial; the fact remains that crystalline 2,2-bis (2,3-epoxypropoxyphenyl) propane is deemed to be obvious as merely directed to an old compound in a crystalline form. * * * Furthermore, although the art cited does not specifically teach the production of the crystalline compound the art does teach the production of other closely related glycidyl ethers of hydroxy phenylalkanes, in crystalline forms and therefore it is deemed to be suggested that the crystalline form of this glycidyl ether would exist in crystalline form under sufficiently conducive conditions. The claimed crystalline compound is thus rendered obvious, 35 U.S.C. § 103.

In subsequent traversal of the examiner's position that the existence of closely related glycidyl ethers of hydroxyphenylalkanes in crystalline form would suggest that 2,2-B the diglycidyl ether of 2,2-bis (4-hydroxyphenyl) propane, would also exist in crystalline form, appellant filed an affidavit of one Kelly to demonstrate that other glycidyl ethers bearing close relationship to 2,2-B do not exist in crystalline form.

Subsequently, in his Answer, the examiner said:

Claims 1 and 8 stand subject to the Final Rejection as lacking invention over any of the Werner et al, Havens, Bender et al or Dearborn et al references, all of which disclose the claimed compound in its normal form, viz. a viscous liquid. Appellant does not dispute this. The claims are directed to a more pure form of the disclosed compound which has been made to crystallize and is claimed in its crystalline form as a manufacture. The claimed compound is not patentable because it is taught by the prior art and is obvious, 35 U.S.C. 103. * * *

The basis for the rejection is, essentially, that the claimed product is merely a different form of a known compound, and, notwithstanding that some desirable results are obtained therefrom, since the product has the same utility as the art compound; the claimed product is deemed to be unpatentable thereover. * * *

The Examiner's suggestion in the Final and Advisory actions given with respect to the obviousness of the instant crystallized product, because of the fact that analogous compounds are known to exist in crystalline form, * * * is withdrawn as being superfluous and not determinative of the essential issues involved in this case. The affidavit of * * * Kelly submitted by applicant * * * is consequently considered to be moot, as the behavior of analogous ***834** compounds with regard to susceptibility of crystallization of the instant compound is considered to have no controlling bearing upon the essential issues of this case. From a factual viewpoint, for whatever it is worth, applicant has shown that four related compounds are not susceptible to crystallization by the methods employed whereas the art shows that certain other related compounds are normally recoverable in the crystalline form.

The board was of the view, and we agree, that:

The sole determinative issue here is whether the claimed product, which is free-flowing and crystalline in form, is obvious, under 35 U.S.C. 103, where the prior art discloses the same compound in its normal form, i.e., as a viscous liquid.

The board observed that:

Appellant points to the various advantages of his product as compared to the prior art compound, such as better color, high epoxy content,**667 lower impurity content, easier to handle in preparing epoxy resins therefrom, better electrical properties, and long shelf life. * * *

After a brief discussion of the respective contentions of the examiner and appellant, the board referred to its decision in Ex parte Hartop, 139 USPQ 525, as 'clearly apposite to the present factual situation,' stating:

* * * We note that the decisions relied on herein, by both the appellant and the Examiner, are discussed therein, and we deem it unnecessary to discuss these again. The conclusion reached therein to the effect ' that merely changing the form, purity or another characteristic of an old product, the utility remaining the same as that for the old product, does not render the claimed product patentable,' is clearly applicable to the factual situations herein, and we will accordingly adopt it here. As pointed out by the Examiner, the prior art resins in viscous liquid form, have the same utility as the claimed crystalline compound, viz., for use in the preparation of synthetic resins, the difference in properties, therebetween resulting only from a greater degree of purity, and, therefore, the be expected. (Emphasis supplied)

Appellant argues that his claims have been rejected solely because his new manufacture is said to have ' have same utility' as the known liquid, and that the record is devoid of any express support for a finding by either the examiner or board that the new physical form of 2,2-B would be obvious. He urges that the board did not give sufficient weight to the pertinent facts of this case, but held, as a matter of law, that a free-flowing crystalline form of a product heretofore known only as a liquid would be obvious under 35 U.S.C. § 103.

We think the record supports those contentions. There is no explanation in the views of the board or examiner why it should be found from the references or from common knowledge that a person skilled in the art would regard free-flowing crystals of 2,2-B to be obvious. In such circumstances, we are not free to search for speculative reasons that might support the rejection, when it is apparent from those opinions that Werner, Bender and Dearborn were ultimately used only to show that 2,2-B was known as a viscous liquid, *835 and not to suggest that the crystalline form would also exist. Indeed, the examiner withdrew his initial finding that the cited prior art would suggest that 2,2-B could exist as crystals after the Kelly affidavit was filed. The board did not discuss that phase of the original rejection.

The board seemingly regarded the question whether appellant's product had the same or different utility as dispositive of the issue here, relying on the discussion of prior case law in Hartop. We see no need to review the cases relied on there save that each case must stand on its own facts. The cited cases fail to support the broad proposition that

* * * merely changing the form, purity or another characteristic of an old product, the utility remaining the same as that for the old product, does not render the claimed product patentable. * * *

We think examination of the decisions relied on here and in Hartop will demonstrate that the materials involved therein were found unpatentable where the alleged difference in form or purity of those substances was either disclosed or inherent in, or rendered obvious by, the prior art of record. Necessarily it is facts appearing in the record, rather than prior decisions in and of themselves, which must support the legal conclusion of obviousness under 35 U.S.C. § 103. Merely stating that a compound or composition is obvious, without adequate factual support, is not sufficient.

To be sure, whether a given chemical compound or composition has the same usefulness as closely related materials may be an important consideration in determining obviousness under 35 U.S.C. § 103. But it is only one consideration. **668 We think the board failed to address itself to other factors which must be given weight in determining whether the subject matter as a whole would have been obvious, namely, whether the prior art suggests the

particular structure or form of the compound or composition as well as suitable methods of obtaining that structure or form. The new form of the compound set forth in the claims is as much a part of the 'subject matter as a whole' to be compared with the prior are as are other properties of the material which make it useful.

[1][2] Apparently recognizing the deficiency in the record before us, the solicitor has devoted a considerable portion of his brief to reasons, accompanied by references to a textbook, which purport to establish obviousness of the crystalline form of 2,2-B and the techniques employed in obtaining the crystals. We look upon those contentions as but an attempted revival of the arguments which were abandoned by the examiner and not mentioned by the board. The solicitor's reliance here on an allegedly standard textbook on chemistry as further support for the Patent Office position illustrates a growing tendency on the part of appellants and the Patent *836 Office alike to impair the clear and specific language of 35 U.S.C. § 144, which requires us to determine the appeal ' on the evidence produced before the Patent Office.' Insofar as the record shows, that textbook was not the subject of discussion Between appellant and the Patent Office, hence is not such 'evidence.' We would remind counsel for all parties that the record upon which they must stand or fall on review here is that which is made in the Patent Office. In most cases, particularly in the chemical field, appeals are sufficiently complex without counsel on either side bringing in, at this late date, technical data which, if relevant, should have been submitted below. Nor do we think it appropriate in the present case to take judicial notice of that textbook, for it appears to relate to a highly technical and empirical area of chemistry and we have no independent way of evaluating its repute and notoriety in the art.

[3] We find the record fails to support a holding that those skilled in the art should have known that 2,2-B would exist in crystalline form or that it would be known how to obtain such crystals. We think it improper to presume such knowledge under the circumstances. In re Williams, 171 F.2d 319, 36 CCPA 756.

Compare In re Adamson, 275 F.2d 952, 47 CCPA 839.

The decision is reversed.

Reversed.

Cust. & Pat.App. 1966.
Application of Cofer
53 C.C.P.A. 830, 354 F.2d 664, 148 U.S.P.Q. 268

END OF DOCUMENT